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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,890	10/19/2004	Satoshi Koura	MAT-8601US	6479

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EXAMINER

RU, POWEN

ART UNIT PAPER NUMBER

2194

DATE MAILED: 07/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/511,890	<b>Applicant(s)</b> KOURA ET AL.	
	<b>Examiner</b> Powen Ru	<b>Art Unit</b> 2194	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10/19/2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>20041019</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This is the initial office action based on the application filed on 10/19/2004.

Claims 1-9 are currently pending and have been considered below.

#### ***Specification***

1. The disclosure is objected to because of the following informalities:
  - Lack of articles, e.g., "... has tweeter 2" (page 2 line 20) should be "... has a tweeter 2" and "Tweeter 2 has ..." (page 2 line 22) should be "The tweeter has ...", The Examiner notices that there are numerous errors in the specification. But it must be remembered that an examination is not made for the purpose of securing grammatical perfection. The Applicant should revise the specification carefully.
  - Spelling error: "thisn" (page 4 line 10) should be "thin" according to the context.
  - Missing reference numbers: "thin films 14" and "amplifier 18" (page 4 line 10). Without providing the reference numbers, a reader may not be sure that the items are the same as other referenced items. The Examiner's correction is based on the context.
  - The term "PZT" (page 3 line 25) should be clearly defined in its first appearance.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 7, and 8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims recite the limitation "[the] second piezoelectric material having a sound reproduction frequency range different from band from a sound reproduction frequency range of the first area" which is not corresponding to the closest possible support in the written description "The second are has a sound reproduction band different from that of the first area" (page 1 line 27 – page 2 line 1). It is not logistic to compare "a sound reproduction frequency range" of a material to that of an area. The Examiner considers the recited limitation is incorrect and will assume the closest possible support as the intended limitation. Besides, "the" is missing in the beginning and "band from" may be redundant. Appropriate correction is required to overcome the rejection.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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5. Claims 1-5 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Murakami (JP58-16999U). The following is a partial translation of Murakami (col 1 line 2 – col 2 line 2):

(1) A piezoelectric loudspeaker speaker comprising: a diaphragm for performing main vibration; and a plurality of piezoelectric elements fixedly attached to one face of the diaphragm, wherein an electrode plate is fixedly attached on the plurality of piezoelectric elements so as to cover the piezoelectric elements .

(2) The piezoelectric loudspeaker speaker of (1), wherein the diaphragm has lower Young's modulus, thinner thickness, and less bending strength than the electrode plate.

(3) The piezoelectric loudspeaker speaker of (1), wherein a plurality of piezoelectric elements have different type of shapes that are mixed and attached on the electrode plate.

Claim 1: Murakami discloses a piezoelectric loudspeaker (e.g., list (1))

comprising: a diaphragm (list (1), diaphragm 3, Fig. 2 and 3); a first piezoelectric material (list (1), piezoelectric element 4, Fig. 3, e.g., large circles) provided in a first area of the diaphragm; and a second piezoelectric material (list (1), piezoelectric element 4, Fig. 3, e.g., small circles) provided in a second area of the diaphragm different from the first area, where the second area has a sound reproduction band different from that of the first area (inherently, the large area has a lower frequency range and the small area has a higher frequency range).

Claim 2: Murakami discloses a piezoelectric loudspeaker as in Claim 1; and further discloses that first and second piezoelectric materials include first and second piezoelectric thin films (list (1), piezoelectric element 4, Fig. 2, and list (2)), respectively.

Claim 3: Murakami discloses a piezoelectric loudspeaker as in Claim 1; and further discloses that the first and second areas have sizes different (list (3), Fig. 3) from each other.

Claim 4: Murakami discloses a piezoelectric loudspeaker as in Claim 1; and further discloses that the first and second piezoelectric materials have sizes different (list (3), Fig. 3) from each other.

Claim 5: Murakami discloses a piezoelectric loudspeaker as in Claim 1; and further discloses that the first and second are provided on a face (list (1), Fig. 2) of the diaphragm.

Claim 8: Murakami discloses an electronic device (Fig. 3) comprising a piezoelectric loudspeaker including a diaphragm (list (1), Fig. 2 and 3); a first piezoelectric material (list (1), piezoelectric element 4, Fig. 3, e.g., large circles) provided in a first area of the diaphragm; and a second piezoelectric material (list (1), piezoelectric element 4, Fig. 3, e.g., small circles) provided in a second area of the diaphragm different from the first area, where the second area has a sound reproduction band different from that of the first area (inherently, the large area has a lower frequency range and the small area has a higher frequency range); and a sound source (the leftmost item connected to the loudspeaker through lead wire 6 and 7, Fig. 3) connected to the piezoelectric loudspeaker.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (JP58-16999U) in view of Buhler et al. (6,924,584). Murakami discloses a piezoelectric loudspeaker as in Claim 5; but does not disclose a frame body. However, Buhler et al. discloses a piezoelectric transducer having a frame body (support structure 26, col 7 lines 15-30) provided on a second face (lower surface 28, with piezoelectric material element 14 on the other surface, col 7 lines 15-30) of the diaphragm and provided around the first and second areas (Fig. 3). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a frame body around the opening areas in piezoelectric speaker design. As Buhler et al. suggested that the frame body (support structure 26) is a rigid material which effectively pins the portion of the diaphragm allowing each piezoelectric material element (14) to act properly when voltage is applied, one would have been motivated to add the frame body (on the surface different from the surface piezoelectric materials being upon) to Murakami's piezoelectric loudspeaker to have better vibration control.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (JP58-16999U) in view of Shimada (3,892,624). Murakami discloses a piezoelectric loudspeaker including a diaphragm (list (1), diaphragm 3, Fig. 2 and 3); a first piezoelectric material (piezoelectric element 4, Fig. 3, e.g., large circles) provided in a first area of the diaphragm; and a second piezoelectric material (piezoelectric element 4, Fig. 3, e.g., small circles) provided in a second area of the diaphragm different from the first area, where the second area has a sound reproduction band different from that

of the first area (inherently, the large area has a lower frequency range and the small area has a higher frequency range); but does not disclose another loudspeaker having a sound reproduction frequency range lower than the sound reproduction frequency ranges of the first and second areas of the piezoelectric loudspeaker. However, Shimada discloses a five-speaker system (col 10 lines 35-40, Fig. 15) comprising two tweeters (2LT, 2RT), two squawkers (2LS, 2RS), and one woofer (2W). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to combine speakers with different sound reproduction frequency range into a loudspeaker system. As Murakami's piezoelectric loudspeaker has limited low frequency response (Fig. 4), one would have been motivated to add at least one loudspeaker having lower sound reproduction frequency range suggested by Shimada to Murakami's piezoelectric loudspeaker to provide wider sound reproduction frequency range.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Ogura et al. (6,978,032) discloses a piezoelectric speaker; and Shimada (4,592,088) discloses a speaker apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Powen Ru whose telephone number is 571-270-1050. The examiner can normally be reached on Monday-Thursday 7:00am-3:30pm EDT.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Myhre can be reached on 571-270-1065. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
PR  
7/10/2006

  
James W. Myhre  
Supervisory Patent Examiner